Counselling Session for IVF/ET patients

1. Please attend the following counselling session.

   **Place:**
   - Seminar Room, Room 509, 5/F, Block K, Queen Mary Hospital
   - Lecture Theatre, Room 602, 6/F, Professorial block, Queen Mary Hospital

   **Date:** _______ / _______ / __________ (dd/mm/yy)

   **Time:** starting from __________PM

2. Read carefully the information sheets and consent forms given to you.

3. Please attend the clinic with your husband and bring along the followings:
   - your marriage certificate (original and a photocopy)
   - consent forms for IVF/ET and freezing and storage of embryos

4. We are happy to answer your questions if you have any queries about your treatment.
Information Sheet for *In Vitro* Fertilization Treatment

(I) **In vitro fertilization & embryo transfer (IVF/ET)**

Broadly speaking, it involves the following steps:

1. **stimulation of ovaries**
2. **egg collection**
3. **sperm washing and fertilization**
4. **embryo transfer.**

1. **Stimulation of ovaries**

Antagonist is used in most patients to prevent early release of immature eggs. Some may be given a nasal spray to prevent the early release of immature eggs, prior to the stimulation. After the period begins, you will be scheduled to undergo a transvaginal scan and a blood test for the female hormone (oestradiol). You will then receive daily injections to stimulate the ovaries to develop multiple follicles (each containing an egg) when there is no large cyst seen in the ovary and the hormone level is basal. You can have injections by your private doctor or self-injection. Please ask for details.

The ovarian response is monitored by transvaginal scanning. The scanning will usually be performed after 7-8 days of injections and subsequent scanning is arranged accordingly. Final maturation of the eggs will be induced when the average diameter of the largest follicle is ≥18 mm and there are at least 3 follicles ≥16 mm in diameter.

2. **Egg collection** (Figure 2)

You will be admitted into Queen Mary Hospital early in the morning. The eggs will be aspirated from your ovaries about 36 hours after an injection of human chorionic gonadotrophin (hCG) in the evening. This is performed with the help of the transvaginal ultrasound scanner. Antibiotics as a precautionary measure will be given prior to the collection. Therefore, you should inform the doctors in advance if you have any drug allergy.
The procedure is usually performed in the minor operation theatre. A pain-killer and a sedative will be given shortly before the procedure. A local anaesthetic agent (lignocaine) will be injected just next to the neck of the womb to further reduce the pain levels during egg collection. Further doses of the pain-killer and/or sedative can be given on request. The whole procedure will usually take 30 minutes. After egg collection, you will be kept in the ward where your condition including blood pressure and pulse will be monitored to ensure that there are no complications e.g. internal bleeding. If all goes well, you can usually be discharged from the hospital four hours after the procedure.

Figure 2: Egg collection under transvaginal ultrasound guidance

3. Sperm washing and fertilization

Your husband will have to give us a sample of semen on the day of egg collection. Freezing of semen samples should be arranged in advance if he has problems to submit the sample due to various reasons.

After the semen has been processed, the sperms will be mixed with or injected into the eggs collected as the case may be. If fertilization is successful, the fertilized egg will start to divide (what we call an embryo).
4. **Embryo transfer** (Figure 3)

The embryos will then be put back into your womb 2 days after the egg collection with the help of the ultrasound scanner placed in the abdomen. Anaesthesia or analgesia is usually not required although you may be given sedation if necessary. After embryo transfer, you can go home in the same day.

![Figure 3: Embryo transfer](image)

Because of the increased risk of multiple pregnancy, we recommend replacing up to two fresh embryos only. In those under the age of 35 years have two or more good quality embryos, only **ONE embryo will be replaced in the first cycle**. If there is excess number of good quality embryos, the embryos can be cryopreserved for a period of two years renewable up to a maximum of ten years. However, both you and your husband have to renew the embryo storage agreement every two years. We may have to dispose of the embryos if you do not renew the agreement. Embryos may not survive on thawing.

After the embryo transfer, you will be given two weeks of vaginal progesterone tablets to support the lining of the womb. Blood may also be taken later to monitor your hormonal levels. Urine pregnancy test will be checked and there is no need to continue the progesterone tablets if you are found pregnant. Pelvic ultrasound will be performed around 2 weeks after a positive pregnancy test.

If the treatment is not successful, your period will return about 14 days after the egg collection. You have to come back for a pregnancy test as scheduled even though you may already notice vaginal bleeding so as to exclude the possibility of early miscarriage or ectopic pregnancy.
(II) **Intracytoplasmic sperm injection (ICSI)**

Intracytoplasmic sperm injection (ICSI) is usually performed in couples with severe male factors, low fertilization rate (<30%) or fertilization failure in previous cycles. The procedure involves direct injection of a single sperm into an oocyte to assist fertilization. (Figure 4)

For men with no sperm in the ejaculate due to obstructive causes, sperms may be obtained by the aspiration from the distended epididymis. If the absence of ejaculated sperm is due to testicular failure, sperms can be recovered from the testicular biopsy. It is important to remind you that it may not be possible to obtain viable mature sperms from the testicular biopsy as the success retrieval of sperm is about 40-50%. The treatment cycle has to be cancelled when no mature sperms can be found in the biopsy.

![Figure 4: Steps during intracytoplasmic sperm injection](image)

The chance of birth defects following ICSI is similar to that observed after conventional IVF/ET. There is a slight increase in the risk of sex chromosome disorder, about 1-1.5% after ICSI compared to 0.5% after natural conceptions or conventional IVF pregnancies.
(III) Frozen-thawed embryo transfer (FET)

The replacement of frozen-thawed embryos can be performed in natural, clomiphene-stimulated or hormone replacement cycles. The number of embryos transferred is still two. Please note that not all cryopreserved embryos will survive the freezing and thawing processes. The usual survival rate is around 70%.

1. Natural cycle

If you have regular menstrual cycles, the frozen-thawed embryos will be replaced after there is evidence that ovulation has occurred. You will be asked to attend the clinic about 18 days before the next expected menses. Blood will be drawn daily to measure hormone levels. Once ovulation is detected, the frozen-thawed embryos are replaced 3 days later in much the same way as fresh embryos.

2. Clomiphene-stimulated cycle

If you have irregular menstrual periods, we can give you clomiphene to induce ovulation. Blood will be drawn daily to measure hormone levels or pelvic ultrasound will be performed from Day 10 onwards. Once ovulation is detected, the frozen-thawed embryos are replaced 3 days later in much the same way as fresh embryos.

3. Hormone replacement cycle

For those who do not ovulate with clomiphene, hormone replacement cycle will be used. You may receive the nasal spray starting from the previous menstrual cycle and this renders the ovaries under our complete control. These patients will then receive hormone tablets (oestrogen) and pessaries (progesterone) to prepare the uterine environment for embryo replacement. The full details will be given at the beginning of the treatment.
(IV) **Psychosocial support**

In general, patients would experience a wide range of psychosocial distress during the treatment phase, such as anxiety, stress, anger, depression, guilt, frustration, sense of loss and so on. Significant positive effects were found on those who had received the psychosocial services.

Patients with psychological problems may be referred to the medical social worker or the clinical psychologist for further counselling. Please let the staff know if you need help during or after the treatment. Counseling is offered independent of the clinical decision-making process and information obtained during counseling would be kept confidential.

(V) **Pregnancy rate**

The pregnancy rate of IVF/ET and FET treatment is 30-40% per cycle. It should be noted that many factors such as age of the woman, history of previous pregnancy, ovarian response and other associated factors may affect the pregnancy rate. There is 20-30% chance of miscarriage in early pregnancies and 4-5% chance of ectopic pregnancy. Therefore, the take-home baby rate is about 20-30% per cycle.

(VI) **Complications**

In general, the treatment procedures in IVF/ET are fairly safe and the complication rate is low. The possible complications include:

(i) multiple pregnancy (~20% when two embryos are replaced);
(ii) ovarian hyperstimulation syndrome (patients may develop abdominal distension, vomiting, ovarian cysts, fluid in the abdomen and the lung etc.; ~4%);
(iii) ectopic pregnancy (i.e. pregnancy located outside the womb; ~5%);
(iv) complications arising from egg collection. e.g. bleeding from the ovaries and pelvic infection (rare, less than 1%);
(v) a possible association with the development of ovarian cancer in later life although there is still no good scientific evidence to support such a link.

In case of high order multiple pregnancy, there is an option of selective fetal reduction which can be considered in those carrying 3 or more fetuses. The procedure, however, is not without risk and may result in loss of all fetuses.
(VII) **Pregnancy course and obstetric outcome**

Studies indicate that the risk of birth defects following IVF is increased by 30-40% when compared with natural conceptions. The prevalence of birth defects in natural conceptions is about 3%. Therefore, the risk of birth defects associated with IVF would be about 4.0%. There is also a slight increase in the risk of sex chromosome disorder after ICSI.

The rates of complications in pregnancy (e.g. ectopic pregnancy, miscarriage, difficulty in delivery) are similar to that in natural conception. However, there may be a 2-3 times increase in the incidence of preterm labour and small for gestational age babies even in singleton pregnancies conceived after IVF / ET compared with those conceived spontaneously.

(VIII) **Miscellaneous**

1. **Genetic screening for the husband**
   
   Poor semen quality may be found in 30%-50% of couples seeking IVF/ET treatment. The cause for this is poorly understood as most of these men appear essentially normal. Previously, the problem may be ascribed to infection, trauma, anatomic malformations, chemical insult or immunological factors. There is increasing evidence that these men had a higher incidence of chromosomal or genetic abnormalities.

   Chromosomal abnormalities have been found in men with very low sperm count (~5%) or without any sperm due to testicular failure (~14%). Sex chromosome abnormalities (mainly 47,XXY) are predominantly found in those without any sperm whereas abnormalities in other chromosomes (Robertsonian and reciprocal translocations) are mainly present in the group with very low sperm counts. Our data indicated that minor deletions of the Y chromosome i.e. microdeletion may be found in 9% of men with very low sperm count or no sperm due to testicular failure.

   Men with very low sperm count (less than or equal to 2 million per ml in the ejaculate) or no sperm due to testicular failure are strongly advised to undergo tests for chromosome abnormalities and microdeletion in the Y chromosome because the chromosomal or genetic abnormalities may be transmitted to their children, if present. Please ask the staff for further details when needed.
2. **Blastocyst transfer**

Embryos are usually transferred to the womb on the second or third day after egg collection in many IVF programmes. Embryos can now be cultured in the laboratory to the fifth day after egg collection when the embryo develops to a stage known as blastocyst. The transfer of blastocyst to the womb has a number of advantages including reduction in the number of embryos to be replaced, thus reducing the risk of multiple pregnancy and the chance to select better embryos for transfer.

The key concern with the blastocyst transfer is that only about half of the fertilized eggs will develop into blastocysts and variations in the ability to produce blastocysts among patients is remarkable. That means some patients may not have any blastocyst for transfer. Other concerns include the potential reduction in the number of embryos available for freezing and an increase in monozygotic twinning.

3. **Preimplantation genetic diagnosis (PGD)**

Preimplantation genetic diagnosis is a method to determine the presence of chromosomal or gene defect in an embryo before transfer. This method allows selection of normal embryos to be transferred to the patients seeking IVF / ET treatment and is an alternative to prenatal diagnosis. For couples with a high chance of carrying an abnormal pregnancy, PGD procedure will reduce such risk. The couples thus do not have to experience the physical and/or psychological trauma of undergoing termination of pregnancy when fetal abnormality is diagnosed by prenatal diagnosis.

PGD is indicated when the fetus is at risk of chromosomal abnormality (e.g. balanced translocation in the couple) or other major genetic diseases (e.g. Thalassaemia and some sex-linked diseases). Gender selection for non-medical reasons is not allowed in Hong Kong. When indicated, the couples will receive further details and genetic counselling before undergoing the PGD procedure.

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